

Work Order ID 57321

April 6, 2010 1:16:13 PM



Page 1

Item ID: D315-668-011

Accept



Setup Start



Revision ID:

Stop



Item Name: Skidtube LH

Start Date: 06/04/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 16/04/2010 Req'd Qty: 1.00

Customer:

Reference:

Run Start



Approvals:

Process Plan: *H*

Date: *10-4-06* Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

Draw Nbr

Revision Nbr

D2904

Rev B

100



DC

Document Control

DOCUMENT CONTROL

Memo

Photocopy bluefile & type labels per PPPD315-668-011

CHG 001

0.00

0.00

Handwritten signature and large 'S' mark

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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Item Name: Skidtube LH

Start Date: 06/04/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 16/04/2010 Req'd Qty: 1.00

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Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

110



Skidtubes

Skidtubes

Skidtubes

Memo

0.00

LANDING GEAR RESOURCE 1

1-Cut D2904b to length as per dwg D2904

10/4/14

2-Drill aft and fwd cap holes as per dwg D2904 using DT8025 jig
(DO NOT OPEN TO FINISH SIZE)

3-Drill saddle holes (6 Deg) as per Dwg D2904 using DT8938A jig
(ENSURE THAT LOCATOR RING IS SET FOR LH TUBE)

4-Drill GHW holes (3 Deg) as per Dwg D2904 using DT8938B jig
(ENSURE THAT LOCATOR RING IS SET FOR LH TUBE)

5-Insert and cleco doublers and DT8938d in position. Transfer all 256 holes thru
tube and doublers.

6-Remove doublers and identify batch# and orientation

7-C'sink Rivet holes 256 places as per Dwg D2904 and deburr

8-Locate from saddle holes, drill wearplate holes using DT8994. Jig must be 1.7"
from aft end of tube (REF)

9-Remove fwd and aft indexing ridges as per dwg D2904. Open fwd and aft cap
holes to finish size, scribe batch# at aft end of tube.

10-Remove marks left from drill jig and deburr

10-4-14

10/5/15

Ro

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D315-668-011 PAR #: _____ Fault Category: Skid plates NCR: Yes ☒ No ☐ DQA: 1 Date: 1008-05

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR: <u>57321</u>		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
10.04.19	110	MS20501AD403 RIVETS ARE BREAKING DURING INSTALLATION	CP 10.04.19 P 05/042	USE CR3212 CR3212-4-03 RIVETS. FSHEAR = 240lb FOR MS20501 FSHEAR = 664lb FOR CR3212	DP 10-5-6	S 10/06/01	CP 10.04.19 P 05/042	S 10/06/01
10.05.20	110	WEARSHOE HOLDS OFF BY 12" NCR 10-073 R.C. Tooling.	CP 10.05.20 P 05/042	SCRAP TUBE CP 10.06.20	BE 10/08/03	DP 10-8-3	CP 10.05.20 P 05/042	CP 10.06.20 P 05/042

NOTE: Date & initial all entries

Chris Provencal

From: Chris Provencal [cprovencal@dartaero.com]

Sent: April 19, 2010 1:32 PM

To: 'David Shepherd'

Cc: 'Mike Petsche'; 'Bill Beckett'; 'Dan Stow'

Subject: RE: Lama skidtube deviation

Per SR-D315-668 Rev. B, the shear strength of the MS20601AD4W3 was 240 lb. Per Cherrymax Rivet Data Sheet, the shear of a CR3212 is 664 lb.

According to Dan, this has been an issue for as long as he can remember, it's just that he would normally just replace the broken rivets without making an issue out of it. The stem is breaking inside the rivet instead of flush with the head.

-Chris

From: David Shepherd [mailto:dshepherd@dartaero.com]

Sent: April 19, 2010 12:03 PM

To: 'Chris Provencal'

Cc: 'Mike Petsche'; 'Bill Beckett'; 'Dan Stow'

Subject: RE: Lama skidtube deviation

As long as you are 100% confident that the rivets are stronger than what you analyzed to, then I am OK with the substitution.

Although we haven't made many Lama skidtubes, this is not the first time we've ever made these parts ... How did we ever make them before? Perhaps we were more skilled 5 years ago?

David

From: Chris Provencal [mailto:cprovencal@dartaero.com]

Sent: Monday, April 19, 2010 9:47 AM

To: 'David Shepherd'

Cc: 'Mike Petsche'

Subject: Lama skidtube deviation

David,

For D315-668-XXX Lama Skidtubes, they want to use CR3212 rivets instead of the MS20601AD4W3 rivets to attach the doublers. They're having to replace about 35% of the mil spec rivets because they break before being able to pull the doubler against the skidtube. They've started using the cherrymax rivets for a few of the doublers and haven't had to replace a single one.

Bill is OK with using the new rivets, the time saved should make up for the additional cost of the rivet.

Besides the obvious strength difference, the MS rivets are all-aluminum, while the cherrymax are aluminum exterior with an alloy-steel-pin. Unless you have an objection, I'll sign off the w/o's (based on stronger rivet and that we've used them on other skids) and update dwgs.

-Chris

No virus found in this incoming message.

Checked by AVG - www.avg.com

Version: 8.5.437 / Virus Database: 271.1.1/2820 - Release Date: 04/19/10 06:31:00

CHERRYMAX® RIVET SELECTION

MECHANICAL PROPERTIES

Materials		Ultimate Shear Strength	Maximum Temperature
Sleeve	Stem		
5056 Aluminum	Alloy Steel	50,000 PSI	250°F
5056 Aluminum	CRES	50,000 PSI	250°F
Monel	CRES	75,000 PSI	900°F
Inco 600	Inco X-750	75,000 PSI	1400°F

MINIMUM RIVET SHEAR & TENSILE STRENGTH (LBS.) IN STEEL COUPONS

RIVET DIAM.	SHEET THICK.	SINGLE SHEAR					TENSILE						
		ALUMINUM		MONEL		INCO	ALUMINUM		MONEL		INCO		
		Nom.	O/S	Nom.	O/S	O/S	Nom.	O/S	Nom.	O/S	O/S		
		3212	3242	3522	3552	3852	3212	3214	3242	3522	3524	3552	3852
		3213	3243	3523	3553	3853	3213	3224	3243	3523		3553	3853
		3214	3245	3524	3555		3222		3245			3555	
		3222	3246		3556		3223		3246			3556	
		3223	3252						3252				
		3224	3253						3253				
			3255						3255				
1/8 (-4)	2x.156	664	814	995	1220	1220	285	250	345	400	360	490	570
5/32 (-5)	2x.187	1030	1245	1545	1865	1865	445	390	530	635	555	740	860
3/16 (-6)	2x.219	1480	1685	2215	2525	2525	635	560	710	890	800	1000	1160
1/4 (-8)	2x.281	2615	2925	3920	4390	4390	1125	1000	1260	1570	1410	1755	2030

Values shown are fastener capabilities only. Design values will be limited by the bearing strength of the sheet material used.

GAGES

269C3 GRIP GAGE

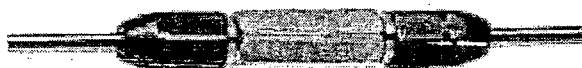
NATIONAL STOCK NUMBER 5210-00-255-7544

A simple, self-explanatory gage for determining material thickness and proper rivet grip length.



T-172 RIVET HOLE SIZE GAGE

These are precision ground, go no-go gages used to check holes drilled for CherryMAX® rivets. They are made in both nominal and oversize rivet diameters.



RIVET DIAMETER	GAGE NUMBER	NATIONAL STOCK NO.	RIVET DIAMETER	GAGE NUMBER	NATIONAL STOCK NO.
1/8" Nominal	T-172-4	5220-00-478-4135	1/8" Oversize	T-172-400	5220-00-478-4137
5/32" Nominal	T-172-5	5220-01-021-3276	5/32" Oversize	T-172-500	5220-00-478-4140
3/16" Nominal	T-172-6	5220-00-478-4136	3/16" Oversize	T-172-600	5220-00-478-4141
1/4" Nominal	T-172-8	5220-00-478-4139	1/4" Oversize	T-172-800	5220-01-374-1340

ATTENTION

Blind rivets are not always a suitable substitute for solid rivets. Maintenance personnel are reminded that AC 43.13-1A chapter 2, section 3 stipulates: "Do not substitute hollow rivets for solid rivets in load carrying members without specific approval of the application by a representative of the Federal Aviation Administration. Blind rivets may be used in blind locations in accordance with the conditions listed in Chapter 5, provided the edge distances and spacings are not less than the minimum listed in paragraph 99d."

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Revision ID:

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Stop



Start Date: 06/04/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 16/04/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
120 QC Quality Control	QC5- Inspect part completeness to step on W/O Memo	0.00 0.00	5 10/05/06			40			
130 HandFinish Hand Finishing	Chemical Conversion Coat per QSI005 4.1 Memo	0.00 0.00				1	-	-	AWM 10-508
140 QC Quality Control	QC3- Inspect Part Finish Memo	0.00 0.00				1	11/05/13		

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Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150	Skidtubes	0.00							
Skidtubes	Memo	0.00							
Skidtubes	LANDING GEAR RESOURCE 1								
	1-Remove alodine around X-Bolt holes on doublers								
	2-Rivet doublers as per Dwg D2904.(DO NOT INSTALL RIVETS AROUND X-BOLT HOLES AT THIS TIME)								
	3-Open X-Bolt spacer holes to finish size as per dwg D2904.(DO NOT USE CUTTING FLUID)								
	4-C'sink and deburr X-Bolt spacer holes, prepare for Welding.								
	5-Blow all chips from inside tube								
	6-Bond web in place per QSI 015. Allow 12 Hrs. cure time before cutting								
	Pick:								
	Qty <input type="checkbox"/> Part Number <input type="checkbox"/> Description <input type="checkbox"/> Batch								
	A/R <input type="checkbox"/> <input type="checkbox"/> Sikaflex-291 <input type="checkbox"/> 1713435 <input type="checkbox"/>								
	Sikaflex expire date: 10/11/10								
	Start Time: 7:40 Date: 01/5/16								
	Fin Time: _____ Date: _____								

11/19/16

W/O:		WORK ORDER CHANGES					
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Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
160  Skidtubes	Skidtubes	0.00							
Skidtubes	Memo LANDING GEAR RESOURCE 1 1-Weld crossbolt spacers D2909as per Dwg. D2904and QSI 004. For D2579 spacers, weld one side, pass Y" drill, weld other side, pass Y" drill A/R□□□ Aluminum Rod 2-Grind welds as per Dwg D2909 3-Install remaining rivets arround X-Bolt spacer , use rivet shaver as necessary 4-Deburr,inspect tube for any visible scratches	0.00							
170  QC	QC5- Inspect part completeness to step on W/O	0.00							
Quality Control	Memo	0.00							

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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180  QC Quality Control	QC10- Inspect visual per QSI004- ground welds Memo	0.00 0.00							
190  HandFinish Hand Finishing	Pressure Wash per QSI005 4.3 Memo	0.00 0.00							
200  Powdercoat Powder Coating	White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum Memo POWDER COATING Powder Coat White Gloss (Ref: 4.3.5.1) as per QSI 005 4.3 START TIME: _____ OVEN TEMPERATURE: _____ FINISH TIME: _____	0.00 0.00							

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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
230  QC Quality Control	QC5- Inspect part completeness to step on W/O Memo	0.00 0.00							
240  Packaging Packaging	Identify as per dwg & Stock Location: _____ Memo	0.00 0.00							
250  QC Quality Control	QC21- Final Inspection - Work Order Release Memo	0.00 0.00							

mf
10-8-01

W/O:		WORK ORDER CHANGES					
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Picklist Print

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Page 1

Work Order ID: 57321

Parent Item: D315-668-011

Parent Item Name: Skidtube LH


Comments: IPP Rev:A New Issue 07-04-12 JLM
IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified by:EC

Start Date: 06/04/2010

Required Date: 16/04/2010

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/	Replacement	Mfg/	Bin	Primary	Last	Route	Unit of	Qty on	Remaining	Qty	Date	Status
D2904B		Manufactured	No			110	Each	2.0000	1.0000			
												
Skidtube, 315												

Warehouse Loc Qty Loc Code

Location

Main Warehouse

LG

2

31826

1

36926

1

110

Each

44.0000 2.0000

D2910

Manufactured

No



Doubler

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST030

44

36927

44

110

Each

53.0000 2.0000

D2911

Manufactured

No



Doubler

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST030

53

36928

53

B57330 ① M12/14/14

W/O:		WORK ORDER CHANGES					
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Start Date: 06/04/2010

Required Date: 16/04/2010

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/	Replacement	Mfg/	Bin	Primary	Last	Route	Unit of	Qty on	Remaining	Qty	Date	Status
MS27039-1-08		Purchased	No			110	Each	1,958.000	54.0000			
Screw												
				<u>Warehouse</u>			<u>Loc Qty</u>		<u>Loc Code</u>			
				<u>Location</u>								
				Main Warehouse								
				ST291			1958					
				110552			44					
				110835			1914					
D2912		Manufactured	No			150	Each	40.0000	2.0000			
Doubler												
				<u>Warehouse</u>			<u>Loc Qty</u>		<u>Loc Code</u>			
				<u>Location</u>								
				Main Warehouse								
				ST030			40					
				36929			40					
MS20601-AD4W3		Purchased	No			150	Each	228.0000	256.0000			
Rivet												
				<u>Warehouse</u>			<u>Loc Qty</u>		<u>Loc Code</u>			
				<u>Location</u>								
				Main Warehouse								
				ST322			228					
				111359			28					
				113899			200					

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Shop Packet Print

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W/O:		WORK ORDER CHANGES					
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IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified by:EC

Start Date: 06/04/2010

Required Date: 16/04/2010

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/	Replacement	Mfg/	Bin	Primary	Last	Route	Unit of	Qty on	Remaining	Qty	Date	Status
D2905		Manufactured	No			160	Each	0.0000	1.0000			
										357333 ①	M 12/5/16	
Web, 315 Skidtube												
ALS4-1032-130		Purchased	No			220	Each	40.0000	50.0000			
												
Insert												
<div> <div>Warehouse</div> <div>Location</div> <div>Main Warehouse</div> <div>ST282</div> <div>110511</div> </div> <div>Loc Qty</div> <div>40</div> <div>40</div>												
AN960JD10L		Purchased	No			220	Each	4,693.000	54.0000			
												
Washer												
<div> <div>Warehouse</div> <div>Location</div> <div>Main Warehouse</div> <div>ST348</div> <div>110985</div> </div> <div>Loc Qty</div> <div>4693</div> <div>4693</div>												

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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Page 4

Work Order ID: 57321

Parent Item: D315-668-011

Parent Item Name: Skidtube LH



Comments: IPP Rev:A New Issue 07-04-12 JLM
IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified by:EC

Start Date: 06/04/2010

Required Date: 16/04/2010

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/	Replacement	Mfg/	Bin	Primary	Last	Route	Unit of	Qty on	Remaining	Qty	Date	Status
D2646		Manufactured	No			220	Each	35.0000	2.0000			
												
Aft Cap												
				<u>Warehouse</u>			<u>Loc Qty</u>		<u>Loc Code</u>			
				<u>Location</u>								
				Main Warehouse								
				FP6			28					
				52663			28					
				Main Warehouse								
				fp7			7					
				52663			7					
D2648-3		Manufactured	No			220	Each	40.0000	5.0000			
												
Wearpad												
				<u>Warehouse</u>			<u>Loc Qty</u>		<u>Loc Code</u>			
				<u>Location</u>								
				OFFSHORE								
				FG			12					
				45316			12					
				Main Warehouse								
				FP17			28					
				52516			28					

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Page 5

Work Order ID: 57321

Parent Item: D315-668-011

Parent Item Name: Skidtube LH



Comments: IPP Rev:A New Issue 07-04-12 JLM
IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified by:EC

Start Date: 06/04/2010

Required Date: 16/04/2010

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/	Replacement	Mfg/	Bin	Primary	Last	Route	Unit of	Qty on	Remaining	Qty	Date	Status
D2656-13		Manufactured	No			220	Each	15.0000	1.0000			
<div>  </div>												
Wearplate												
<div> <div>Warehouse</div> <div>Location</div> <div>Main Warehouse</div> <div>FP20</div> <div>55454</div> <div>Main Warehouse</div> <div>MEZZ</div> <div>44158</div> </div>												
<div> <div>Loc Qty</div> <div>12</div> <div>12</div> <div>3</div> <div>3</div> </div>												
<div> <div>Loc Code</div> <div></div> <div></div> <div></div> <div></div> </div>												
D2656-33		Manufactured	No			220	Each	22.0000	1.0000			
<div>  </div>												
Wearplate												
<div> <div>Warehouse</div> <div>Location</div> <div>Main Warehouse</div> <div>MEZZ</div> <div>43806</div> <div>46167</div> </div>												
<div> <div>Loc Qty</div> <div>22</div> <div>9</div> <div>13</div> </div>												
<div> <div>Loc Code</div> <div></div> <div></div> <div></div> </div>												

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Page 5

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Page 6

Work Order ID: 57321

Parent Item: D315-668-011

Parent Item Name: Skidtube LH



Comments: IPP Rev:A New Issue 07-04-12 JLM
IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified by:EC

Start Date: 06/04/2010

Required Date: 16/04/2010

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/	Replacement	Mfg/	Bin	Primary	Last	Route	Unit of	Qty on	Remaining	Qty	Date	Status
D2907		Manufactured	No			220	Each	32.0000	1.0000			
												
Wearshoe												
<div> <div>Warehouse</div> <div>Location</div> <div>Main Warehouse</div> <div>FP</div> <div>14654</div> </div>												
<div> <div>Loc Qty</div> <div>32</div> <div>32</div> <div>Each</div> </div>												
<div> <div>Qty on</div> <div>129.0000</div> </div>												
<div> <div>Remaining</div> <div>11.0000</div> </div>												
												
D2909												
Spacer, Lama												
<div> <div>Warehouse</div> <div>Location</div> <div>Main Warehouse</div> <div>LG</div> <div>12947</div> <div>14091</div> </div>												
<div> <div>Loc Qty</div> <div>129</div> <div>13</div> <div>116</div> </div>												
<div> <div>Loc Code</div> </div>												

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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NOTE: Date & initial all entries



DESIGN <i>CP</i>	DRAWN BY <i>CP</i>	DART AEROSPACE USA, INC. BELLEVUE, WA	
CHECKED <i>HA</i>	APPROVED <i>HA</i>	DRAWING NO. D2904	Rev. B SHEET 1 OF 3
DATE 00.06.21		TITLE SA 315B SKIDTUBE ASSEMBLY	SCALE NTS
A	99.09.09	NEW ISSUE	
B	00.06.21	CHANGED ANGLES FOR HOLES	

PARTS LIST:

Qty -041	Qty -042	Part Number	Description
X		D2904-041	LH SKIDTUBE ASSEMBLY
	X	D2904-042	RH SKIDTUBE ASSEMBLY
2	2	D2646	CAP
4	4	D2648-3	WEARPAD
1	1	D2648-5	WEARPAD
1	1	D2656-13	WEARSHOE
1	1	D2656-33	WEARSHOE
1		D2904-1	SKIDTUBE
	1	D2904-2	SKIDTUBE
1	1	D2905	WEB
1	1	D2907	WEARSHOE
11	11	D2909	CROSS BOLT SPACER
2	2	D2910	SKIDTUBE DOUBLER
2	2	D2911	SKIDTUBE DOUBLER
2	2	D2912	SKIDTUBE DOUBLER
50	50	ALS7-1032-130 or AKS4-1032-130 or ALS4-1032-130 or ALS7-1032-130	INSERT
54	54	AN960JD10L	WASHER
256	256	MS20601AD4W3	RIVET
54	54	MS27039-1-08	SCREW

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER

NO. 57321

BJ10-4-05

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DATE	STEP		PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DESIGN <i>CP</i>	DRAWN BY <i>CP</i>	DART AEROSPACE USA, INC. BELLEVUE, WA	
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DRAWING NO. D2904	Rev. B SHEET 2 OF 3
DATE 00.06.21		TITLE SA 315B SKIDTUBE ASSEMBLY	SCALE 1:20

GENERAL NOTES:

w/d 57321

1. TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
2. MAKE D2904-1 AND D2904-2 FROM D2914 EXTRUSION (INITIAL LENGTH = 142.0).
3. DAMAGE TOLERANCE ON BENDING:
THERE SHOULD BE NO VISIBLE WRINKLES IN THE BEND FROM THE GROUND TO A HEIGHT OF 7 INCHES ABOVE THE GROUND. NO GOUGING IS ACCEPTABLE IN THE FLAT PORTION OF THE TUBE. GOUGES UP TO 0.020 ARE ACCEPTABLE IN THE BENT PORTION OF THE TUBE. TUBE O.D. SHOULD BE 3.150 ± 0.010 IN THE FLAT PORTION OF THE TUBE. A MAXIMUM REDUCTION IN DIAMETER OF 0.150" IS ACCEPTABLE IN THE BENT PORTION OF THE TUBE.
4. ALL HOLES DRILLED ON CENTERLINES EXCEPT THOSE NOTED BY SECTION C-C.
5. DRILL #30 HOLES ($\varnothing 0.128$ REF) TO LINE UP WITH $\varnothing 0.128$ HOLES IN D2910/D2911/D2912 DOUBLERS. C'SINK $\varnothing 0.239 \times 100^\circ$.
6. BOND D2905 WEB INTO D2904-1 (OR D2904-2) OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241/291 ADHESIVE PER DART QSI 015. ENSURE HOLES LINE-UP.
7. WELDING TO BE DONE PER DART QSI 004.
8. AFTER DRILLING, BENDING, AND INSTALLING WEB & DOUBLERS, PERFORM THE FOLLOWING FOR $\varnothing 0.500$ HOLES ONLY:
 - CHAMFER HOLE $0.050 \times 45^\circ$
 - INSERT D2909 SPACER (11 PLACES)
 - WELD INTO PLACE
 - GRIND FLUSH
 - DRILL OUT SPACER TO $\varnothing 0.406$
9. FINAL CONFIGURATION SHOULD HAVE THE FOLLOWING MINIMUM MECHANICAL PROPERTIES:
 - MINIMUM YIELD TENSILE STRENGTH = 35 ksi
 - MINIMUM ULTIMATE TENSILE STRENGTH = 38 ksi
10. FINISH:
 - ACID ETCH, ALODINE ASSEMBLY PER DART QSI 005 4.1 PRIOR TO INSTALLING D2905 WEB AND D2910/D2911/D2912 DOUBLERS.
 - POWDER COAT WHITE (REF. 4.3.5.1) PER DART QSI 005 4.3
 - BLACK ANTI-SKID PAINT AS INDICATED TO 1.0 ABOVE SKIDTUBE CENTER-LINE PER DART 005 4.4 (OPTIONAL).
11. DRILL $\varnothing 0.297$ FOR ALS7-1032-130 INSERT USING DT8395 BEFORE FINISH. INSTALL ALS7-1032-130 INSERTS AFTER FINISH.

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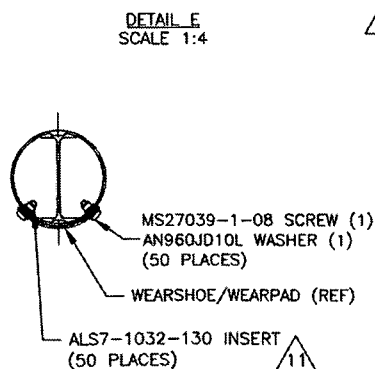
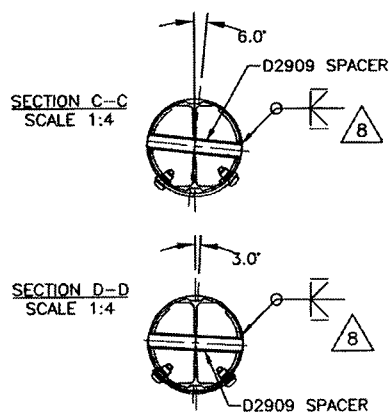
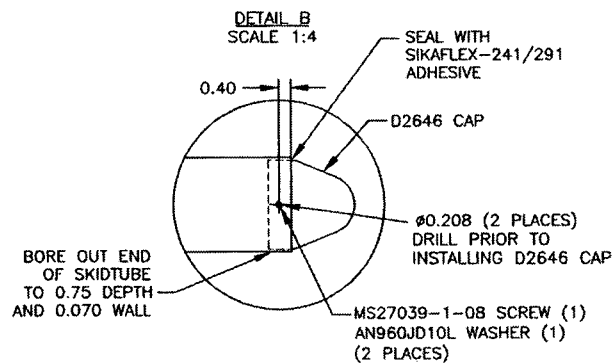
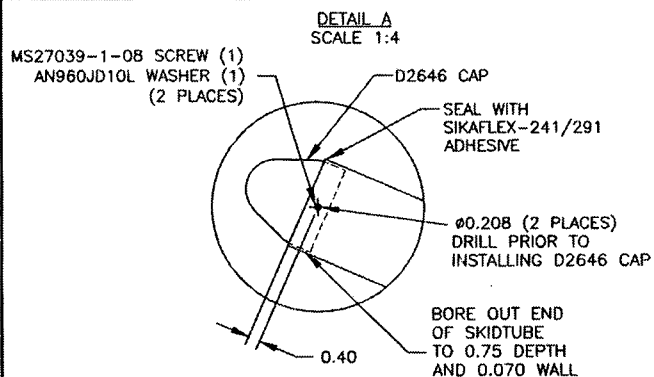
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DATE	STEP		PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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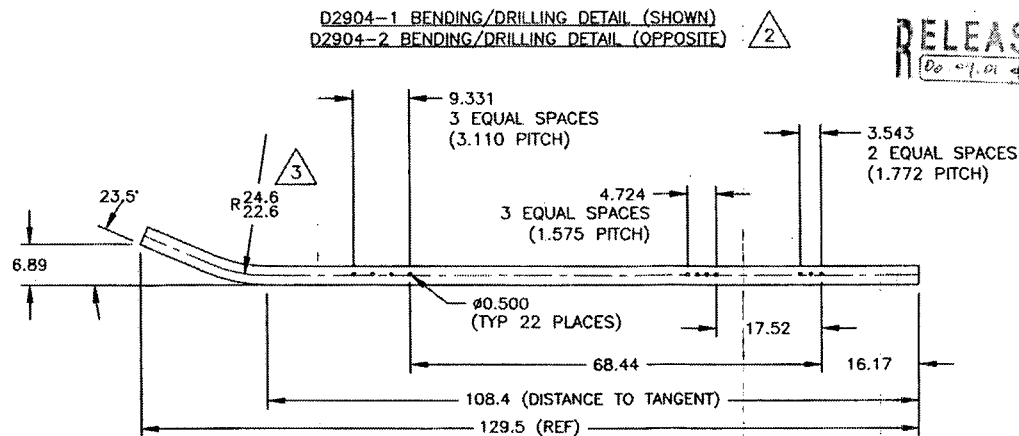
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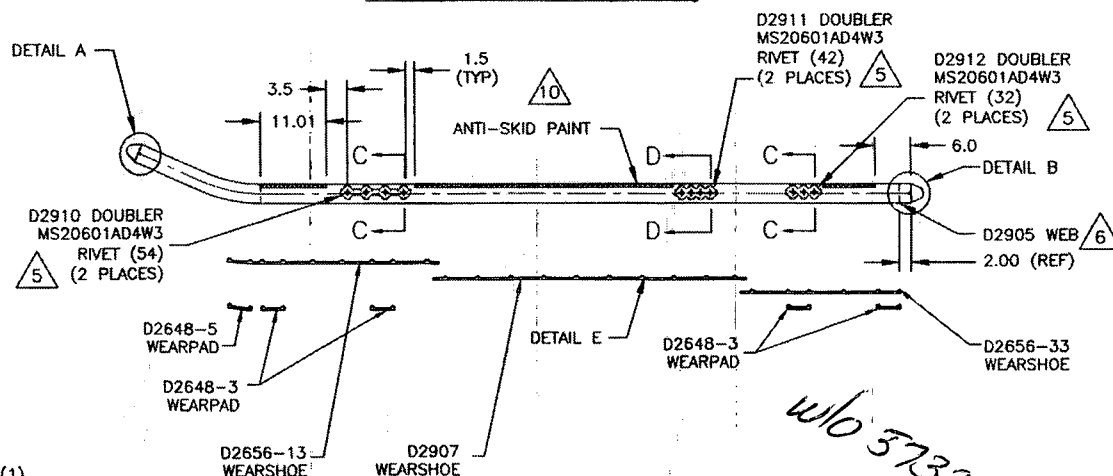
NOTE: Date & initial all entries



D2904-1 BENDING/DRILLING DETAIL (SHOWN)
D2904-2 BENDING/DRILLING DETAIL (OPPOSITE)



D2904-Q41 LH ASSEMBLY DETAIL (SHOWN)
D2904-Q42 RH ASSEMBLY (OPPOSITE)



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DESIGN	CP	DRAWN BY	CP	DART DART AEROSPACE USA, INC. BELLINGHAM, WA	REV. B
CHECKED	#	APPROVED	#	DRAWING NO. D2904	SHEET 3 OF 3
DATE	00.06.21	TITLE	SA 315B SKIDTUBE ASSEMBLY	SCALE	1:20

W/O:		WORK ORDER CHANGES					
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